

Abstract:

This paper proposes the Bayesian semiparametric dynamic Nelson-Siegel model for estimating the density of bond yields. Specifically, we model the error distributions of the yield curve factors according to an infinite Markov mixture (iMM). The model allows for time variation in the mean and covariance matrix of factors in a discrete manner, as opposed to continuous changes such as Time Varying Parameter (TVP) models. Estimating the number of regimes using the iMM structure endogenously leads to an adaptive process that can generate newly emerging regimes over time in response to changing economic conditions in addition to existing regimes. The potential of the proposed framework is examined using US bond yields data. The semiparametric structure of the factors can handle various forms of non-normalities including outliers and nonlinear dependence between factors using a unified approach by generating new clusters capturing these specific characteristics. We document that modeling parameter changes in a discrete manner increases the model fit as well as forecasting performance at both short and long horizons relative to models with fixed parameters as well as the TVP model with continuous parameter changes. This is mainly due to fact that the discrete changes in parameters suit the typical low frequency monthly bond yields data characteristics better.